BRANCHING OUT
IPM NEWSLETTER FOR TREES & SHRUBS

Exotic Threats: Oak Splendor Beetle & Siberian Silk Moth

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In an effort to minimize the impact of invasive species, the United States Department of Agriculture Animal Plant Health Inspection Service (USDA-APHIS) conducts risk assessments on destructive plant pests that have a potential pathway into the US. These pests are not known to be in the country but pose a serious threat should they be introduced. The earlier a pest is detected, the greater chance that pest can be quarantined and eradicated. However as time increases and the size of the infestation spreads exponentially, eradication becomes unfeasible and the strategy moves to suppression and management.

This article highlights two pests on USDA's watch list—a borer that could prove difficult to find and a defoliator that could be easy to find—should either ever be introduced.

Oak splendor beetle

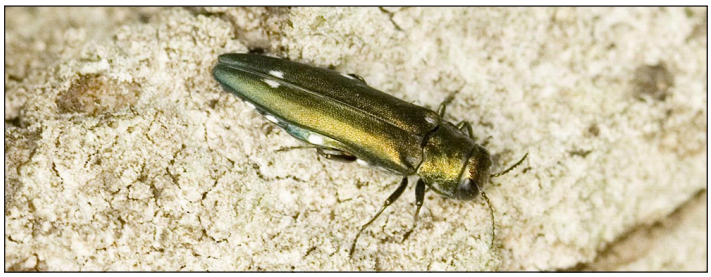
The **oak splendor beetle, *Agrilus biguttatus*** is an aggressive secondary invader that is native to Europe, northern Africa and Asia. While it only attacks weakened trees, it has been attributed to be a significant component of oak decline or oak dieback.

The oak splendor beetle is a relative of *A. planipennis,* the emerald ash borer (EAB). Like EAB, the oak splendor beetle is a metallic woodboring beetle in the family Buprestidae. Like other buprestid beetles, the larvae feed in the cambial layer of trees which in time girdle the tree.

Description & Life Cycle

Adult oak splendor beetles emerge in mid-spring through D-shaped exit holes in the bark surface. Adults feed on host tree foliage for maturation feeding and mate. Female beetles deposit clusters of 5–6 eggs in bark crevices of the host tree. Eggs hatch in 1–2 weeks and the newly hatched larvae bore into the cambium where they create zigzag-shaped galleries. Young larvae overwinter and begin to feed again once temperatures warm up in spring. Older larvae create wider galleries that can reach up to 155 cm in length. Pupation occurs in the bark in individual chambers and adults emerge after two weeks. Typically one generation develops over a two-year period.

Adult beetles are slender and similar in appearance to the emerald ash borer. Oak splendor beetles are often medium metallic green with bronze highlights and two diagnostic white spots on the elytra (forewings). Color is variable however with some individuals appearing blue or gold. Shape is characteristic for the genus *Agrilus*—slender, sub-cylindrical (bullet-shaped), averaging 9–12 mm long.



Adult oak splendor beetle © Milan Zubrik, Forest Research Institute–Slovakia, Bugwood.org

Larvae have characteristic *Agrilus* features—long, flat nested bell segments. Larvae are legless grubs, reaching 25–43 mm long when fully grown and are creamy white in color. Like EAB, oak splendor beetle larvae have two hornlike projections on the last abdominal segment. Identification to species would have to be done by a buprestid taxonomist.

Larva of the oak splendor beetle © Gyorgy Csoka, Hungary Forest Research Institute, Bugwood.org

Oak splendor beetles feed primarily on oak species but infestations have been reported on European beech, *Fagus sylvatica*, and European chestnut, *Castanea sativa*. It is important to mention that these hosts are the same as those of the native twolined chestnut borer, *A. bilineatus*.

Monitoring for the oak splendor beetle is difficult because damage symptoms develop slowly and look like those caused by native borers, drought or stress. This pest prefers larger, stressed oak trees. Common symptoms include dieback, thinning, epicormic sprouting, bark splits and weeping or oozing from the trunk. Woodpecker activity could also indicate that borers are present.

While scouting if you find trees with these symptoms look more closely for signs of an infestation including D-shaped exit holes or adult beetles. Adult beetles are not easy to find but are the best way to confirm an identification. Adult beetles will be most active during May–July when they are mating, laying eggs and feeding on oak foliage.

Galleries from the oak splendor beetle larvae © Milan Zubrik, Forest Research Institute–Slovakia, Bugwood.org

Siberian silk moth

The **Siberian silk moth, *Dendrolimus sibiricus,*** is the most harmful defoliator of coniferous forests in North Asia. To date it has NOT been found in North America. The Siberian silk moth is able to attack and kill healthy plants and has been known to kill trees and forests across very wide areas.

D. sibiricus feeds primarily on conifers in the pine family. Hosts include *Larix* spp., *Abies* spp., *Pinus* spp., and *Picea* spp. Douglas-fir, *Psuedotsuga menziesii*, is a new host that is not found within the pest's native range. There are no known Lepidoptera larvae that feed on conifers in the Northeast therefore the presence of large caterpillars on coniferous trees should raise a red flag!

Description & Life Cycle

In the middle of its range *D. sibiricus* takes two years to complete its life cycle. Scientists predict that it would take one year to complete its life cycle in the US. Flight of adult moths occurs in mid-July. Moths are large and variously colored yellowish-brown, light grey to dark brown or black. Forewings are marked with three dark, notched stripes and a white spot usually present near the center of the forewing. Hindwings are not marked.

Siberian silk moth adult © Vladimir Petko, V.N. Sukachev Institute of Forest SB RAS, Bugwood.org

Immediately after mating, females lay eggs on the needles of host trees. Females lay an average of 200–300 eggs, with some laying as many as 800 eggs. Eggs are about 2.2 x 1.9 mm and elongated. They are light-green when laid, turning creamy-white, and becoming darker and spotted.

Eggs of the Siberian silk moth are typically present in the field for about 13–15 days © John H. Ghent, USDA Forest Service, Bugwood.org

Siberian silk moth larva © John H. Ghent, USDA Forest Service, Bugwood.org

Larvae (caterpillars) are mainly black or brown and hairy with numerous spots. First instar larvae feed on the edges of needles. Later instars eat the entire needle. In addition, older larvae may eat portions of the plant buds, young cones and the bark of twigs. Third instar larvae migrate to the soil where they overwinter in leaf litter. Larvae return to the crowns the following spring and feed on remaining needles and the bark of young shoots and cones. In autumn, the larvae migrate to overwinter for a second time.

Siberian silk moth larvae hibernating in the leaf litter © John H. Ghent, USDA Forest Service, Bugwood.org

In May and June of the next year, the larvae feed intensively eating about 95% of the food they require for development. This last instar is the most damaging. These late instar larvae are typically 55–70 mm long but can get up to 100 mm. In June, larvae create cocoons spun with silk, needles and small branches. Each cocoon is gray or brownish, compact, rough and 70 x 12 to 15 mm. Pupation takes about one month.

Cocoons of Siberian silk moth © John H. Ghent, USDA Forest Service, Bugwood.org